



# Seafood Is Good for You!

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**B**aked, broiled, steamed, or grilled, seafood is good for you! It's a great low-cal choice for your diet and is easier to digest than red meats and poultry. Chock full of proteins and vitamins, seafood also is low in total fat. In fact, the fat in seafood is rich in omega-3 fatty acids, which promote healthy hearts and brain development. If you add up the nutritional benefits, toss in ease of preparation, and a delicious taste, you'll find that seafood is a good food to add to your weekly shopping list.



## One Fish, Two Fish . . .

The U.S. Department of Agriculture (USDA) recommends that we maintain a healthy diet — one that emphasizes fruits, vegetables, whole grains, and fat-free or low-fat milk and dairy products; includes lean meats, poultry, fish, beans, eggs, and nuts; and is low in saturated fats, trans fats, cholesterol, sodium, and added sugars. The USDA and the U.S. Department of Health and Human Services also advise that by adding seafood to your diet, as little as two meals of fish or shellfish per week (and a daily dose of exercise!), you'll be well on your way to a healthier lifestyle.

## A Low-Fat, Low-Cholesterol Food

Because most finfish and shellfish are low in fat, averaging only 1–5% in total fat, most seafood has only 90–100 calories per 3-ounce serving. Compare that to the same size serving of ground beef, which has 15–20% fat and about 230 calories, and it's easy to see why seafood is a healthier choice when prepared in a low-fat recipe. Deep-frying or serving seafood with a cream sauce can add extra fat and calories, but broiling, barbecuing, poaching, microwaving, or steaming on a rack can help minimize the amount of fat in your dish.

Adding seafood to your diet also can help you meet the USDA dietary guideline to “reduce cholesterol consumption to 300 milligrams per day.” One serving of fish (3 ounces, cooked) averages about 30–90 milligrams of cholesterol; shellfish

## Cholesterol Content of Seafood

Seafood (3 oz. serving)	Cholesterol (milligrams)
Mollusks (clams, oysters, scallops)	48–90 mg
Crustaceans (crabs, lobster, shrimp)	80–160 mg
Finfish (catfish, cod, salmon)	50–70 mg

have only slightly higher cholesterol content, ranging from 80–160 milligrams per serving.

## The Bonus: Fish Oils

Consequently, eating seafood is a good idea — it's compatible with optimum dietary practices and recommendations, and it can help you maintain a low-fat diet. The bonus, the consumption of fish oils, provides additional heart and health benefits.

Fish oils, like other fats or lipids, are composed of glycerol to which three fatty acids are attached. The fatty acids contain chains of carbon atoms linked by single and/or double bonds. Polyunsaturated fatty acids contain several double bonds between carbon atoms in the chain — the more double bonds, the higher the degree of unsaturation. Fish oils are unique in that they are rich in essential polyunsaturated fatty acids called omega-3 fatty acids.

The most important omega-3 fatty acids found in seafood are eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). Fish and shellfish ingest and accumulate EPA and DHA through the food chain from microscopic algae and phytoplankton — the primary producers of omega-3 fatty acids. Since our bodies are unable to provide their own omega-3 fatty acids, we need to obtain them through food. U.S. health organizations recommend that we consume 250 milligrams per day of DHA plus EPA. Although all fish contain omega-3 fatty acids, the quantities of EPA and DHA vary among species and depend on diet, environment, and whether the fish is wild-caught or farm-raised. Oily fish are one of the best sources of these essential fatty acids, particularly salmon, fresh tuna, and trout.

Most nutrition researchers say that eating seafood twice a week may be beneficial in preventing coronary heart disease. Not only may the polyunsaturated fatty acids in seafood reduce the risk of arrhythmia in diseased heart muscle, but they also lower blood cholesterol and



## Omega-3 Fatty-Acid Content in Wild vs. Farm-Raised Fish

Seafood Species & Type	Grams per 3-oz. serving
<i>Atlantic Salmon</i>	
Wild . . . . .	0.9–1.56 g
Farm-Raised . . . . .	1.09–1.83 g
<i>Rainbow Trout</i>	
Wild . . . . .	0.84 g
Farm-Raised . . . . .	0.98 g
<i>Catfish</i>	
Wild . . . . .	0.2 g
Farm-Raised . . . . .	0.15 g
<i>Oysters, Eastern</i>	
Wild . . . . .	0.66 g
Farm-Raised . . . . .	0.35 g

**Sources:** P. M. Kris-Etherton et al. (2002), *Circulation* 106: 2747–2752; USDA Nutrient Laboratory Data.

triglyceride levels, two important indicators for heart disease. Omega-3 fatty acids help maintain a critical balance of lipoproteins, increasing the levels of high-density lipoprotein (HDL) that are responsible for carrying cholesterol away from the artery walls. Omega-3 fatty acids also form a different pattern of prostaglandins (hormone-like compounds), which minimizes blood clot formation, reduces the number and stickiness of blood platelets, and makes red blood cells more flexible so that they flow through the arteries more smoothly.

Researchers suggest that increasing your intake of omega-3s from seafood provides many other health benefits in addition to preventing heart disease. An excellent anti-inflammatory agent, omega-3 fatty acids can alleviate the symptoms of arthritis, asthma, inflammatory bowel disease, multiple sclerosis, and psoriasis. They also may help counteract Alzheimer’s disease, cystic fibrosis, depression, diabetes, emphysema, headaches, and some kidney diseases. Omega-3s also appear to be effective against some types of cancers; they may reduce the body’s production of cancer-promoting enzymes, delay or reduce tumor development in breast cancer, and prevent the development of benign polyps into malignant colon tumors.

### Get Seafood into Your Diet — What to Do?

What can you do to increase your seafood consumption level? First, ask yourself what seafood you already enjoy and eat regularly. Review your favorite seafood recipes; then ask your retailer what other fish or shellfish could be substituted. Trying new types of seafood in old recipes is an easy way to increase the variety of seafood you eat.



Next, try substituting seafood in some of your beef or poultry recipes. Seafood can be added to homemade pizza, tacos and fajitas, or lasagna and it’s a natural in many stir-fry recipes. If once a week or once every other week you substitute seafood in recipes calling for red meat or poultry, you will have taken another step toward increasing the amount of seafood you eat.

Restaurants are great places to try new types of seafood. Ask the staff what the seafood dish tastes like and how it is prepared; then you can judge whether or not you might like it. Remember to watch out for butter, cream sauces, and fried foods. Also, your local supermarket or seafood retailer may have some delicious recipes to share. One of our favorites is a low-fat fish chowder (see recipe on back); kids clamor for seconds! Lots of recipes also are available on the National Fisheries Institute’s Web site at [www.aboutseafood.com](http://www.aboutseafood.com).

Pregnant or nursing moms, women of childbearing age, and young children, don’t shy away from seafood! Omega-3s promote neural and visual development in infants and have been shown to moderate developmental disorders in young children. Low-fat and packed with protein, fish provides the best source of omega-3s for mothers and children. In fact, you can safely enjoy up to 12 ounces of seafood per week by making informed choices about the types of fish you eat. While the Food and Drug Administration and the Environmental Protection Agency recommend not eating shark, swordfish, tilefish, or king mackerel, which accumulate high concentrations of mercury, they DO recommend eating clams, shrimp, ocean perch, salmon, catfish, pollock, and a variety of other fish that don’t concentrate mercury in their tissues. For more information on seafood advisories, visit the Food and Drug Administration’s Web site at [www.cfsan.fda.gov/~dms/admehg3.html](http://www.cfsan.fda.gov/~dms/admehg3.html). Also, check with your state or local government offices for information on eating locally caught fish.

### The Best Ways to Prepare Seafood

The way you prepare seafood is very important! Select techniques and recipes that minimize fat, so you don’t spoil seafood’s natural low-calorie appeal. If you’re going to meet the U.S. Dietary Guideline for reducing total fat consumption to 20–35% of your daily calorie intake, you need to make food selections that derive low percentages of their calories from fat. The chart at right provides information on calories and nutrients for selected fish and shellfish.

Calories from fat add up quickly. A gram of fat has nine calories, more than twice the calories of carbohydrates and protein, which each provide four calories per gram. To calculate the percent of calories from fat in a particular food, multiply grams of fat by nine, divide by the number of calories in the food, and multiply the result by 100. For example, 3 ounces of light-meat chicken (cooked, skinless) has 148 calories and 3.9 grams of fat; therefore,  $3.9 \times 9 = 35$ , and  $35 \div 148 = 0.23$ ;  $0.23 \times 100 = 23\%$  of calories from fat.

Now, think about how you like to eat your chicken, say a juicy breast, batter-dipped, and deep-fried. This mouth-watering recipe provides twice the calories from fat, 45%! This happens to fish, too. A piece of haddock breaded and deep-fried also derives 45% of its calories from fat, but if you broiled that same

## Nutrient Composition of Selected Fish & Shellfish

Seafood	Preparation (3-oz. serving)	Calories (kcal)	Protein (grams)	Total Fat (grams)	% of Calories From Fat	Omega-3 DHA & EPA (grams)	Cholesterol (mg)	Sodium (mg)
Blue Crab*	Steamed	90	19	1	10	0.4	95	330
Blue Mussels	Steamed	147	20	3.8	23	0.7	48	313
Bluefish	Baked, skinless	131	21	4.5	31	0.8	63	64
Catfish*	Baked, skinless	130	19	6	41	NA	60	65
Clams*	Steamed, 12 small	110	22	2	14	0.2	80	95
Cod*	Broiled, skinless	90	19	1	10	0.1	50	55
Croaker	Baked, skinless	111	19	3.4	28	NA	65	59
Flounder*	Baked, skinless	100	19	1	9	0.4	55	100
Haddock*	Broiled, skinless	90	20	1	10	0.2	70	75
Halibut*	Broiled skinless	120	22	2	15	0.4	30	60
Lobster*	Boiled	100	20	1	9	0.1	100	95
Monkfish	Baked, skinless	80	15	1.6	18	NA	26	20
Ocean Perch*	Baked, skinless	100	20	2	18	0.3	50	80
Orange Roughy	Broiled, skinless	70	16	1	13	NA	20	70
Oysters*	Steamed, 12 small	120	12	4	30	0.7	80	300
Pollock*	Broiled, skinless	100	21	1	9	0.5	80	90
Rainbow Trout*	Broiled, skinless	130	20	4	28	0.6	55	30
Rockfish* (Striped Bass)	Baked, skinless	100	20	1.5	13.5	0.4	40	65
Salmon* (Atlantic, Coho, Chinook, Sockeye)	Baked, skinless	190	24	10	47	0.9	65	65
Salmon* (Pink, Chum)	Baked, skinless	130	22	4	28	NA	70	65
Scallops*	Broiled, 14 small	140	27	1	6	NA	60	310
Sea Trout	Broiled, skinless	110	18	3.8	31	0.4	88	61
Shark	Baked, skinless	139	22	4.8	31	NA	54	84
Shrimp*	Boiled	100	22	1.5	13.5	0.3	170	250
Sole*	Broiled, skinless	100	19	1	15	NA	55	100
Squid	Boiled	156	27	2.4	14	NA	396	74
Swordfish*	Baked, skinless	120	16	6	45	NA	NA	NA
Tilapia*	Baked, skinless	110	22	2.5	20	NA	75	30
Tuna*	Baked, skinless	139	26	1.5	15	NA	50	40

**Sources:** National Fisheries Institute, Seafood Nutri-Facts, Food Marketing Institute, and FDA Proposed Food Labeling Guidelines 2002.

NA: Data not available

\* Most frequently consumed fish and shellfish in the United States.

piece of haddock (without bread crumbs), only 10% of the calories would come from fat.

Along with higher fat calories, deep-fried fish tends to have lower omega-3 fatty acid content than the same portion of baked or broiled fish. In a study of the cardiovascular benefits of fish consumption, researchers estimated that a person who ate one fried-fish sandwich per week ingested 75% less dietary omega-3s than if he ate one meal of baked or broiled fish per week! Frying with oil also counteracts the benefits of omega-3s by shifting the balance of essential fatty acids toward a less healthy ratio.

Now that you know the best techniques to prepare your seafood, make sure you keep it safe to eat! Thaw frozen seafood in the refrigerator or microwave and then cook it the same day. When you bring fish home from the supermarket or begin to make a recipe, separate the raw fish from other foods, surfaces, utensils, or serving plates. Cook fish and shellfish until they are opaque; fish should flake easily with a fork. You also should refrigerate any leftovers within two hours after serving them. Following these simple rules will help ensure that your seafood is safe to eat however you prepare it.

So remember, seafood is naturally nutritious, and it's low in calories and total fat. By adding more seafood — prepared healthfully and safely — in your diet today, you can look forward to a healthier future!

## For More Information

These Web sites and publications provide more information about seafood and your health:

Delaware Sea Grant College Program. "Outreach-Seafood Technology." [www.deseagrant.org/outreach/seafood](http://www.deseagrant.org/outreach/seafood)

Environmental Protection Agency. "Fish Advisories." [www.epa.gov/waterscience/fishadvice/advice.html](http://www.epa.gov/waterscience/fishadvice/advice.html)

Environmental Protection Agency. "Guide to Healthy Eating of the Fish You Catch." [www.epa.gov/ost/fish/fisheng.pdf](http://www.epa.gov/ost/fish/fisheng.pdf)

Food and Drug Administration. "What You Need to Know About Mercury in Fish and Shellfish." [www.cfsan.fda.gov/~dms/admehg3.html](http://www.cfsan.fda.gov/~dms/admehg3.html)

## Vegetable Fish Chowder

- 1 tablespoon vegetable oil
- 1 medium onion, chopped
- 2 medium carrots, chopped
- 2 stalks celery, chopped
- 2 medium potatoes, peeled and cubed
- 2 1/2 cups water
- 1 bay leaf



- 1/2 teaspoon thyme
- 1/2 teaspoon dill
- 1 1/2 pounds firm, white-fleshed fish such as haddock or cod cut into bite-sized chunks
- 1 can (12 oz.) evaporated skim milk
- Pepper to taste

1. Heat oil in a 4-quart saucepan and sauté onion about 5 minutes.
2. Add carrots, celery, potatoes, water, and herbs. Cover and gently simmer until vegetables are just tender, about 15 minutes.
3. Add fish and simmer about 5 to 10 minutes more, until fish is just cooked.
4. Stir in evaporated skim milk and heat to serving temperature; do not boil.
5. Add salt, if desired, and pepper to taste.

National Fisheries Institute. "About Seafood." [www.aboutseafood.com](http://www.aboutseafood.com)

U.S. Department of Agriculture. "My Pyramid." [www.mypyramid.gov](http://www.mypyramid.gov)

## References

- "Food Labeling; Guidelines for Voluntary Nutrition Labeling of Raw Fruits, Vegetables, and Fish; Identification of the 20 Most Frequently Consumed Raw Fruits, Vegetables, and Fish, Proposed Rule." *Federal Register* 67: 12918 (March 20, 2002).
- Kris-Etherton, P. M., et al. 2002. "Fish Consumption, Fish Oil, Omega-3 Fatty Acids, and Cardiovascular Disease." *Circulation* 106:2747-2757.
- Lopez-Huertas, E., et al. 2003. "n-3 Fatty Acids-Enriched Foods: Cardiovascular Health as a Target." *NutraFoods* 2:13-19.
- Lopez-Huertas, E., et al. 2003. "n-3-Fatty Acids: Health Effects and Opportunities to Increase Intakes." *Agrofood Industry Hi-Tech*. May/June, 18-21.
- Mozaffarian, D., et al. 2003. "Cardiac Benefits of Fish Consumption May Depend on the Type of Fish Meal Consumed. The Cardiovascular Health Study." *Circulation* 107: 1372-1377.
- Nettleton, J., ed. PUFA Newsletter. [www.fatsoflife.com](http://www.fatsoflife.com)
- U.S. Dept. of Health and Human Services. U.S. Dept. of Agriculture. 2005. *Dietary Guidelines for Americans*. [www.healthierus.gov/dietaryguidelines](http://www.healthierus.gov/dietaryguidelines)

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